Computer Science Standards Alignment

Standards

Legend

•	The standard is clearly addressed by program activities.
-	This standard potentially could be addressed as part of *FIRST*® LEGO® League Discover either by actions that the coach or teacher takes when working with the students or by conditions established by the program.

Grades K-2

Cluster	Indicator	Indicator Statement	Addressed
Computing Systems	1A-CS-01	Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use.	
	1A-CS-02	Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).	
	1A-CS-03	Describe basic hardware and software problems using accurate terminology.	
Networks & the Internet	1A-NI-04	Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access.	
Data & Analysis	1A-DA-05	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.	
	1A-DA-06	Collect and present the same data in various visual formats.	
	1A-DA-07	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.	
Algorithms & Programming	1A-AP-08	Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.	
	1A-AP-09	Model the way programs store and manipulate data by using numbers or other symbols to represent information.	
	1A-AP-10	Develop programs with sequences and simple loops, to express ideas or address a problem.	
	1A-AP-11	Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.	
	1A-AP-12	Develop plans that describe a program's sequence of events, goals, and expected outcomes.	
	1A-AP-13	Give attribution when using the ideas and creations of others while developing programs.	
	1A-AP-14	Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.	
	1A-AP-15	Using correct terminology, describe steps taken and choices made during the iterative process of program development.	
Impacts of Computing	1A-IC-16	Compare how people live and work before and after the implementation or adoption of new computing technology.	
	1A-IC-17	Work respectfully and responsibly with others online.	
	1A-IC-18	Keep login information private, and log off of devices appropriately.	

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Computing Systems	1A-CS-01	Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use.	-
	1A-CS-02	Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).	-
	1A-CS-03	Describe basic hardware and software problems using accurate terminology.	-
Networks & the Internet	1A-NI-04	Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access.	
Data & Analysis	1A-DA-05	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.	-
	1A-DA-06	Collect and present the same data in various visual formats.	-
	1A-DA-07	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.	-
Algorithms & Programming	1A-AP-08	Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.	-
	1A-AP-09	Model the way programs store and manipulate data by using numbers or other symbols to represent information.	-
	1A-AP-10	Develop programs with sequences and simple loops, to express ideas or address a problem.	●
	1A-AP-11	Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.	●
	1A-AP-12	Develop plans that describe a program's sequence of events, goals, and expected outcomes.	●
	1A-AP-13	Give attribution when using the ideas and creations of others while developing programs.	-
	1A-AP-14	Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.	●
	1A-AP-15	Using correct terminology, describe steps taken and choices made during the iterative process of program development.	-
Impacts of Computing	1A-IC-16	Compare how people live and work before and after the implementation or adoption of new computing technology.	
	1A-IC-17	Work respectfully and responsibly with others online.	-
	1A-IC-18	Keep login information private, and log off of devices appropriately.	-

Grades 3-5

Cluster	Indicator	Indicator Statement	Addressed

Computing Systems	1B-CS-01	Describe how internal and external parts of computing devices function to form a system.	-
	1B-CS-02	Model how computer hardware and software work together as a system to accomplish tasks.	-
	1B-CS-03	Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.	-
Networks & the Internet	1B-NI-04	Model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination.	-
	1B-NI-05	Discuss real-world cybersecurity problems and how personal information can be protected.	-
Data & Analysis	1B-DA-06	Organize and present collected data visually to highlight relationships and support a claim.	-
	1B-DA-07	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.	-
Algorithms & Programming	1B-AP-08	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.	-
	1B-AP-09	Create programs that use variables to store and modify data.	-
	1B-AP-10	Create programs that include sequences, events, loops, and conditionals.	-
	1B-AP-11	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.	-
	1B-AP-12	Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.	-
	1B-AP-13	Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.	-
	1B-AP-14	Observe intellectual property rights and give appropriate attribution when creating or remixing programs.	-
	1B-AP-15	Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.	-
	1B-AP-16	Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.	●
	1B-AP-17	Describe choices made during program development using code comments, presentations, and demonstrations.	-
Impacts of Computing	1B-IC-18	Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.	
	1B-IC-19	Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users.	-
	1B-IC-20	Seek diverse perspectives for the purpose of improving computational artifacts.	-
	1B-IC-21	Use public domain or creative commons media, and refrain from copying or using material created by others without permission.	

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Grades 3-5

Cluster	Indicator	Indicator Statement	Addressed
Computing Systems	1B-CS-01	Describe how internal and external parts of computing devices function to form a system.	-
	1B-CS-02	Model how computer hardware and software work together as a system to accomplish tasks.	-
	1B-CS-03	Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.	-
Networks & the Internet	1B-NI-04	Model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination.	-
	1B-NI-05	Discuss real-world cybersecurity problems and how personal information can be protected.	-
Data & Analysis	1B-DA-06	Organize and present collected data visually to highlight relationships and support a claim.	●
	1B-DA-07	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.	●
Algorithms & Programming	1B-AP-08	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.	●
	1B-AP-09	Create programs that use variables to store and modify data.	-
	1B-AP-10	Create programs that include sequences, events, loops, and conditionals.	●
	1B-AP-11	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.	●
	1B-AP-12	Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.	-
	1B-AP-13	Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.	●
	1B-AP-14	Observe intellectual property rights and give appropriate attribution when creating or remixing programs.	-
	1B-AP-15	Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.	●
	1B-AP-16	Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.	●
	1B-AP-17	Describe choices made during program development using code comments, presentations, and demonstrations.	●
Impacts of Computing	1B-IC-18	Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.	-
	1B-IC-19	Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users.	-
	1B-IC-20	Seek diverse perspectives for the purpose of improving computational artifacts.	-

	1B-IC-21	Use public domain or creative commons media, and refrain from copying or using material created by others without permission.	-

Grades 6-8

Cluster	Indicator	Indicator Statement	Addressed
Computing Systems	2-CS-01	Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices.	-
	2-CS-02	Design projects that combine hardware and software components to collect and exchange data.	-
	2-CS-03	Systematically identify and fix problems with computing devices and their components.	-
Networks & the Internet	2-NI-04	Model the role of protocols in transmitting data across networks and the Internet.	-
	2-NI-05	Explain how physical and digital security measures protect electronic information.	-
	2-NI-06	Apply multiple methods of encryption to model the secure transmission of information.	-
Data & Analysis	2-DA-07	Represent data using multiple encoding schemes.	-
	2-DA-08	Collect data using computational tools and transform the data to make it more useful and reliable.	-
	2-DA-09	Refine computational models based on the data they have generated.	-
Algorithms & Programming	2-AP-10	Use flowcharts and/or pseudocode to address complex problems as algorithms.	●
	2-AP-11	Create clearly named variables that represent different data types and perform operations on their values.	-
	2-AP-12	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.	-●
	2-AP-13	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.	●
	2-AP-14	Create procedures with parameters to organize code and make it easier to reuse.	●
	2-AP-15	Seek and incorporate feedback from team members and users to refine a solution that meets user needs.	●
	2-AP-16	Incorporate existing code, media, and libraries into original programs, and give attribution.	-
	2-AP-17	Systematically test and refine programs using a range of test cases.	●
	2-AP-18	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.	●
	2-AP-19	Document programs in order to make them easier to follow, test, and debug.	●
Impacts of Computing	2-IC-20	Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.	-
	2-IC-21	Discuss issues of bias and accessibility in the design of existing technologies.	-
	2-IC-22	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.	-
	2-IC-23	Describe tradeoffs between allowing information to be public and keeping information private and secure.	-